



उत्पाद मैनुअल

Hollow Steel Sections for Structural Use — Specification (Second Revision)
4923: 2017 के अनुसार

PRODUCT MANUAL FOR
Hollow Steel Sections for Structural Use — Specification (Second Revision)
ACCORDING TO IS 4923: 2017

विभिन्न उत्पादों के लिए भारतीय मानक ब्यूरो) अनुरूपता मूल्यांकन (विनियम, 2018 की योजना -I के तहत प्रमाणन के संचालन में एकरूपता और पारदर्शिता के लिए इस उत्पाद मैनुअल का उपयोग सभी क्षेत्रीय / शाखा कार्यालयों और लाइसेंसधारियों द्वारा संदर्भ सामग्री के रूप में किया जाएगा। दस्तावेज़ का उपयोग बीआईएस प्रमाणन प्राप्त करने के इच्छुक संभावित आवेदकों द्वारा भी किया जा सकता है।

This Product Manual shall be used as reference material by all Regional/Branch Offices & licensees to ensure uniformity of practice and transparency in operation of certification under Scheme-I of Bureau of Indian Standards (Conformity Assessment) Regulations, 2018 for various products. The document may also be used by prospective applicants desirous of obtaining BIS certification.

1.	मानक संख्या IS No.	:	IS 4923: 2017
	शीर्षक Title		
	संशोधनों की संख्या No. of amendments	:	3
2.	नमूना दिशानिर्देश Sampling Guidelines		
a)	कच्चा माल Raw material	:	The seamless hollow steel sections shall be manufactured from steel made by any process at discretion of the manufacture which shall show not more than 0.040 percent of sulphur and 0.040 percent of phosphorus. The welded hollow sections shall be manufactured from hot rolled steel strips conforming to IS 2062/IS 10748. Note: This section indicates the requirements for raw material (if specified in the IS) for which compliance is to be established during Grant of Licence/Change in Scope of Licence/Factory Surveillance
b)	समूहीकरण दिशानिर्देश Grouping Guidelines	:	Please refer Annex – A

c)	नमूने का परिमाण Sample Quantity	:	Mechanical Test :1 pc of 1 meter length Chemical test : 5 pcs of 5cm x 5cm Note: This section indicates the quantity of the sample of the product and/or the raw material (if applicable), required to be sent to the laboratory for testing, for the purpose of Grant of Licence/Change in Scope of Licence/ Factory Surveillance (in case of market surveillance, effort may be made to procure the required quantity of product sample, as far as possible since raw material sample may not be available in market)
d)	Additional Guidelines	:	Please refer Annex- B
3.	परीक्षण उपकरणों की सूची List of Test Equipment	:	Please refer to Annex-C देखें
4.	निरीक्षण और परीक्षण की स्कीम Scheme of Inspection and Testing	:	Please refer to Annex-D देखें
5.	एक दिन में संभावित परीक्षण Possible tests in a day		
	All tests Note: This section is for the guidance of BIS Certification Officers/Technical Auditors of BIS Authorized Outside Surveillance Agencies (OSAs) during factory inspection to provide readyreference regarding the tests which can be witnessed during the inspection in the factory by the officer/auditor.		
6.	लाइसेंस का दायरा /Scope of the Licence:		
	4923:2017 के अनुसार मानक मुहर का उपयोग करने के लिए लाइसेंस निम्नलिखित कार्यक्षेत्र के लिए प्रदान किया जाता है “ Licence is granted to use Standard Mark as per IS 4923:2017 with the following scope:		
7.	Name of the product		Hollow Steel Sections for Structural Use
8	Designation		Welded (WT) Square/Rectangular Sections of Depth x Width frommm x mm to up to and including mm x mm, Thickness frommm to up to and including mm
9	Manufacturing process		Seamless/Welded (ERW/HFIW etc.)
10	Grade		YSt 210, YSt 240, YSt 310, YSt 355, YSt 420 and YSt 460
11	Coating		Uncoated (Black)/Galvanized

ANNEXURE A
PRODUCT MANUAL FOR
Hollow Steel Sections for Structural Use — Specification (Second
Revision)According to IS 4923:2017

GROUPING GUIDELINES

- a) IS 4923:2017 covers the requirements for hot and cold formed square and rectangular hollow steel sections for structural use. These sections have graded as YSt 210, YSt 240, YSt 310, YSt 355, YSt 420 and YSt 460 depending on the yield strength of the hollow steel section (See Table 3 and Table 4).
- b) The standard sizes and weights of hollow steel sections with other geometrical properties are given in Table 1 and Table 2. Any other size and thickness mentioned in Table 1 and Table 2 may be supplied subject to agreement between the purchaser and the manufacturer. However, for all such non-standard sizes, the thickness of hollow steel sections shall not be less than the minimum thickness specified for the next higher standard size in Table 1 and Table 2.
- c) Hollow Steel Sections can be varnished, painted or oiled or galvanized as per agreement between the purchaser and manufacturer. r. In the case of galvanizing, the mass of the coating shall be tested as per IS 6745. The requirement of mass of zinc coating shall be as per IS 4736.
- d) The sections covered under IS 4923:2017 may be divided into four groups for drawing samples:

Group	Depth of Section (D)	Number of samples
1	Up to & including 38 mm	One sample of any Section (i.e. square/rectangular) of any thickness and any Grade shall be drawn and tested to cover all sizes within the Group for that section and Grade.
2	Greater than 38 mm & upto & including 63.5 mm	-do-
3	Greater than 63.5 mm & upto & including 100 mm	-do-
4	Greater than 100 mm	-do-

- e) If manufacturer intends to cover both Sections (Square and Rectangular) in the scope, the samples drawn of different sizes from the above Groups shall be such that samples of both Sections (Square and Rectangular) are drawn and tested.
- f) If manufacturer intends to cover different Grades (among YSt 210, YSt 240, YSt 310, YSt 355, YSt 420 and YSt 460) in the scope, the samples drawn of different sizes from the above Groups shall be such that samples of all Grades, intended to be covered in the licence, are drawn and tested.
- g) If Hot Dip Galvanized Sections are required to be covered in the scope of the licence, samples of Hot Dip Galvanized Sections shall be drawn, from each Group, and tested for all requirements of the standard including the requirements of Zinc Coating as per cl.11.1. of IS 4923:2017 (also refer IS 4736). If Hot Dip Galvanized Sections are drawn and tested, Uncoated (Black) Sections may also be covered in the scope of the licence.
- h) Scope of the licence shall be restricted based on the manufacturing and testing facilities available.
- i) During the operation of the licence, samples of each variety covered in the scope of licence, shall be tested in rotation, to the extent possible.

ANNEXURE B
PRODUCT MANUAL FOR
Hollow Steel Sections for
Structural Use According to IS
4923:2017

ADDITIONAL GUIDELINES
FOR MANUFACTURERS WHO INTEND TO
OUTSOURCE POST BLACK SECTION OPERATIONS

1. The post black section operation could be galvanizing.

Action by licensees

- i. The licensee intending to outsource post black section operation shall outsource these operations only to a manufacturer holding a valid BIS licence for IS 4923:2017.
- ii. For the purpose of these guidelines, the licensee which is outsourcing the post black section operation shall be called Licensee A and the licensee to whom the operation is being outsourced, shall be licensee B.
- iii. Black sections shall be dispatched by the licensee A for post black section operations to the licensee B, control unit wise. Both the licensee A and B shall maintain records for post black section operations as per frequency stipulated in the SIT. These records shall be made available by both licensees for examination to BIS Certification Officers or Agents during surveillance visits or whenever otherwise sought by BIS.
- iv. The responsibility of conformity of the product in respect of all requirements shall lie with both the licensees.
- v. The licensee A shall emboss the Standard Mark (ISI) and its licence number on the black sections conforming to IS 4923 along with all other details as per the marking clause of the SIT. The sections shall be sent control unit wise to the licensee B. The licensee B shall employ 'transfix labels' for identification on the sections; the label shall contain IS No. over Standard Mark and under Standard Mark, its licence number and the phrase 'Only Galvanizing' (See image below); after ensuring conformity of post black section operations to the IS 4923.



- vi. The licensee A shall issue the test certificate of the ISI marked black sections as per IS 4923 along with each consignment of the black sections dispatched to licensee B. The licensee B, after carrying out Galvanizing and testing conformity of galvanizing as per the requirement of the purchaser, shall issue the final test certificate of Galvanized sections, incorporating the results of both the black sections and Galvanizing, and other details such as Batch No./Lot No., Size(s), Grade, Quantity etc. for ensuring traceability to the black sections. All such sections, after Galvanizing, shall be dispatched by Licensee B after enclosing the final test certificate of the Galvanized sections.

Action by BOs

- i. The post black section operations shall be verified by the BO during the next surveillance of the outsourcer licensee unit and the licensee unit to whom this operation is outsourced. During the operation of licence, all such records maintained by the licensee and the outsourced unit shall be verified by the IOs.
- ii. If the licensee and the outsourced unit are under different BOs, the BO receiving the request shall inform the other BO accordingly and the BO under which the outsourced unit is located shall verify the post black section operations during the next surveillance and shall provide the necessary information to the BO.

**BUREAU OF INDIAN STANDARDS
ManakBhawan, 9, Bahadur Shah Zafar Marg,
New Delhi – 110002**

ANNEX – B

LIST OF TEST EQUIPMENTS

(INDICATIVE LIST, FOR GUIDANCE ONLY)

Sr. No.	Test Equipment	Tests used in with Clause Reference
1)	Device for instrumental chemical analysis such as Optical Spectrometer with all requisite channels, certified reference materials etc. OR Equipment, Apparatus and reagents as per as per the relevant parts of IS 228 in case of analysis as per IS 228	Chemical analysis of steel used for making hollow sections, Cl 7.1
2)	Universal Testing Machine (UTM) as per IS 1608 (Part 1), class 1 accuracy or better.	Mechanical Test, Cl 15 of IS 4923
3)	Solvent Naptha, Trichloroethylene or any other suitable organic solvent , Alcohol, Antimony Trioxide, Antimony Trichloride, Conc, Hydrochloric Acid, Weighing Balance, Soft Cotton cloth	Mass of Zinc Coating,Annex B
4)	Coating Thickness Gauge such as an Elco Meter	Coating Thickness, Annex B
4)	i) Vernier caliper gauge or any other suitable device ii) Steel scale iii) Micrometer (screw) gauge or other suitable device iv) Feeler gauges, Go/No-Go gauges v) Spirit Level and horizontal flat surface	Dimension, Cl 10 of IS 4923
5)	Platform balance or any other suitable instrument	Weight, Cl. 9 and Table 1 and Table 2

ANNEX C

SCHEME OF INSPECTION AND TESTING

1. QUALITY ASSURANCE PLAN

1.1 It is expected that manufacturers (licensees/applicants) will implement a Quality Assurance Plan i.e. a plan of regular testing and in-process controls, designed to ensure that the product bearing the Standard Mark conforms to all requirements of the Indian Standard.

1.2 The manufacturers shall define a Quality Assurance Plan defining the control unit (i.e. lot/batch etc.) and the levels of control (i.e. the frequency and number of samples for conducting the different tests as per the Indian Standard) and submit the same to BIS Branch Office for information. The manufacturer shall comply with the same and maintain test records in accordance with para 2.4.

1.3 RECOMMENDED LEVELS OF CONTROL/CONTROL UNIT:

1.3.1 For the guidance of manufacturers, the recommended definition of control unit is: Hollow Sections (uncoated(black/galvanized) of the same size, grade and manufactured from the same cast of raw material on the same line in one go shall constitute a control unit.

1.3.2 For the guidance of manufacturers in preparing the Quality Assurance Plan, recommended levels of control are given in **Table 1**.

1.3.3 The manufacturer shall ensure inspection and testing as per the Quality Assurance Plan submitted by them on the whole production of the factory which is covered by this plan. Alternatively, the manufacturer has the option of adherence to the quality plan as per levels of control recommended in column 3 of Table 1.

1.4 However, all manufacturers shall ensure compliance of their products to all the requirements of the Indian Standard.

2. ENSURING COMPLIANCE THROUGH TESTING- It is expected that manufacturers (licensees/applicants) will establish a suitably equipped and staffed in house laboratory (In house testing facility) for testing at least those parameters of the Indian Standard which require routine testing for ensuring quality of the product. This includes in-process controls as may be defined and put in place by the manufacturer and testing parameters/requirements which can only be performed in the factory.

2.1 For the guidance of manufacturers, Table 1 giving the recommended levels of control is given below. Column 2 of Table 1 indicates routine tests where test equipment is required in house as "R" or other tests which can be subcontracted as "S". Subcontracting is permitted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.2 For MSME manufacturers, the requirement of maintaining a laboratory/in-house testing facility for routine tests (indicated as "R" in Column 2 of Table 1) is also optional.

2.2.1 MSME manufacturers may utilize common cluster based facilities as per guidelines for the utilization of cluster based test facilities by MSMEs or the provisions of Sharing of testing facilities or get testing done from BIS recognized/empaneled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025.

2.3 Large Scale manufacturers shall maintain an in-house laboratory equipped at least with test facilities for routine tests (indicated as “R” in Column 2 of Table 1), where different tests given in the specification shall be carried out in accordance with the method given in the specification. They shall also implement a calibration plan for the in-house test equipment.

2.3.1 Alternatively, in lieu of an in-house laboratory, large scale manufacturers can also utilize the provisions of Sharing of testing facilities as per the Guidelines for Grant of Licence available on BIS website www.bis.gov.in. (Under Conformity Assessment>Product Certification Process). Even for subcontracted tests, provisions for sharing of testing facilities can be utilized.

2.4 TEST RECORDS- The manufacturers maintaining an in-house laboratory or utilizing common cluster based facilities or shared test facilities shall maintain test records for the tests carried out to establish conformity. For the tests being subcontracted to BIS recognized/empanelled laboratory or any other laboratory having valid NABL accreditation as per IS/ISO/IEC 17025, test reports issued by the laboratories shall be available for inspection by BIS.

3. PACKING AND MARKING - The Standard Mark, as given in the Schedule of the licence, shall be embossed or marked at a suitable place on the outside surface of the hollow sections or on a label attached to a bundle of sections provided always that hollow sections so marked conform to requirements of the specification.

3.1 Packing and Marking shall be done as per the Indian Standard.

4. TEST CERTIFICATE- For each consignment of BIS Certified material conforming to IS 4923:2017 there shall be a test certificate which shall contain the Standard Mark, the cast/Control Unit number and the corresponding test results (as given in Annexure-I, enclosed).

5. REJECTION - All the production which conforms to the Indian Standard and covered under the scope of this licence shall be marked with the Standard Mark. Disposal of non-conforming product shall be done in such a way so as to ensure that there is no violation of provisions of BIS Act, 2016. <Any product specific requirements to be inserted her

TABLE 1
(ONLY FOR GUIDANCE PURPOSE)

(1)			(2)	(3)		
Test Details			Test equipment	Levels of Control		
Cl.	Requirement	Test Methods Clause Reference	requirement R: required (or) S: Sub-contracting permitted	No. of Sample	Frequency	Remarks
7.1,7.1.1	Manufacture	IS 228 or any other established instrumental /chemical methods	S	One	Each Heat/Cast	The seamless hollow steel sections shall be manufactured from steel made by any process at discretion of the manufacture which shall show not more than 0.040 percent of sulphur and 0.040 percent of phosphorus. The welded hollow sections shall be manufactured from hot rolled steel strips conforming to IS 2062/IS 10748. No further testing is required if the raw material procured for manufacturing of sections is ISI marked and is received with Test Certificate
9,10,10.1, 10.2, 10.3, 10.4, 10.5, 10.6,10.7, ,14,18,Table 1, Table 2	Dimensions and Weights, Measurement of Size and Shape,- Straightness, Outside Dimension, Thickness, Concavity/Convexity Squareness of Sides, External Corner Radius ,Twist, Length, Weight	IS 4923	R	Firm to have adequate in-process controls to check compliance of this parameter as per the tolerances given in the Indian Standard. However, appropriate records shall be maintained by the manufacturer for evidence of conformity		
11	Oiling and Painting	IS 4923 IS 6745 IS 4736	R	One	Each Control Unit	---

15.1,15.2, Table 3, 19.1,19.2, Table 4	Mechanical Test	IS 4923 IS 1608 (Part 1)	R	One	Each Control Unit	----
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ANNEXURE I
TEST CERTIFICATE FORMAT
XYZ COMPANY
TEST CERTIFICATE FOR Hollow Steel Sections According
to IS 4923:2017

TEST CERTIFICATE NO. _____ DATED _____

To M/s _____

It is certified that the material described below fully conforms to IS 4923:2017. Chemical and physical properties of the product, as tested in accordance with the Scheme of Inspection and Testing contained in the BIS Certification Marks Licence No. CM/L _____

(PLEASE REFER TO IS 4923:2017 FOR DETAILS OF SPECIFICATION REQUIREMENTS)

TEST RESULTS

Order no & date	Raw Material HR Strip Grade	Cast No./ Melt No.	Quantity (in tonnes)	Chemical Analysis (in %)		Size	Mechanical Properties	Dimensions and weight	Size and Shape	Oiling and Painting	Remarks
				S%	P%						

As and when tested

REMARKS

SHIPPING ADVICE NO. WAGON No.s

“For details of BIS certification please visit www.bis.gov.in”